EXHIBIT 19

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(54) MULTIPLE WAVELENGTH SENSOR EMITTERS

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(Continued)

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(58) Field of Classification Search

None

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

3,316,395 A 4/1967 Lavin 3,316,396 A 4/1967 Lavin (Continued)

FOREIGN PATENT DOCUMENTS

DE 3244695 C2 10/1985 EP 0 231 379 8/1987 (Continued)

OTHER PUBLICATIONS

US 8,845,543 B2, 09/2014, Diab et al. (withdrawn) (Continued)

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(57) ABSTRACT

A physiological sensor has light emitting sources, each activated by addressing at least one row and at least one column of an electrical grid. The light emitting sources are capable of transmitting light of multiple wavelengths and a detector is responsive to the transmitted light after attenuation by body tissue.

29 Claims, 48 Drawing Sheets

